

Atlantic/Central Base Expansion Demolition Materials Recycling



"The Nibbler" at work sorting through demolition debris.

OWNER

King County Department of Transportation

DEMOLITION CONTRACTOR

Iconco Demolition and Salvage Contractors



"The Nibbler" reduced concrete blocks into 1-inch diameter concrete pieces.

LOCATION

Sixth Avenue and Royal Brougham, Seattle, Washington

BUILDING DEMOLITION CONTRACT VALUE

\$1.4 million (as part of larger \$92 million parking project cost)

BUILDING TYPE

Industrial warehouse demolition (in preparation for automobile parking garage and bus parking lot development)

SITE IN ACRES

7.5 acres on two city lots

TOTAL PROJECT SAVINGS DUE TO RECYCLING

Over \$2.4 million

APPLICABLE LEED™ CREDITS

Materials and Resources Credit 2 - Construction Waste Management

Demolition Materials Salvaged

King County achieved an 84% recycling rate in the demolition phase of the Atlantic / Central Base parking garage and bus parking project. The project required demolition of two city blocks in the SODO district in south Seattle, just east of the Mariners and Seahawks Stadiums. As a result of early planning and coordination with adjacent projects, Mike Stanaszek, King County project manager, easily achieved the LEED™ Construction Waste Management credit (MR Credit 2.0).

Planning Ahead for Success

Early planning incorporated 'green specifications' into the construction waste management bid documents. A detailed survey of building materials prior to demolition allowed the demolition contractors time to provide accurate bids reflecting adequate timelines to salvage and recycle as many materials as possible. Time was also built into the construction schedule for researching the best end uses and best prices for salvaged materials. Two staging and materials storage areas were created and used simultaneously by a neighboring construction project on the site.

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"The crushed concrete readily achieved specified compaction criteria for use as select backfill for construction of a 5-story parking garage."

Project Background

In 2001 King County Executive Ron Sims established the Green Building Initiative directing county projects to lead by example in promoting green building practices on its projects. The Transit Division has demonstrated this leadership in its approach to the Atlantic/ Central Base expansion project.

The Atlantic/ Central Base expansion will allow King County Transit to house more than 550 buses in the new facility. This is a 50 percent increase over its present capacity of 370. The \$92 million project is scheduled for completion in 2007. The project began in early 2003 with the demolition and salvage of two city blocks to make way for the new Atlantic/ Central Base Parking Garage and Bus Parking area. The principles of reuse and recycling embodied in the Green Building Initiative guided the deconstruction project.

Project Recycling at a Glance

Material	Volume	Weight (tons)	Recycling - Reuse Rate	Recycled Material Value	End Use
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LEED Recycled Materials

Concrete (150 lb/cubic foot)	7,455 cubic yards	15,000	100%	\$59,640	Used on project site
Steel	N/A	285	100%	\$11,400	Sold for recycling
Copper	N/A	15	100%	\$9,000	Sold for recycling
Old growth timber Douglas Fir	200,000 board feet	292	100%	\$1.1 million	Sold for re-milling and resale

Total LEED Recycled Material	N/A	15,592	84%	\$1,180,040	
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Landfilled Materials

Mixed Debris, Regulated Waste	N/A	3,000	Not Applicable	(135,000)	Landfilled
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Non LEED Recycled Material

Soil (LEED™ excludes soil)	8,000 cubic yards.	12,000	100%	\$0 Break Even	Re-used on nearby site
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Recycling Successes

Concrete

Steel and Copper

Old growth timber Wood Beams

Using a piece of heavy equipment called 'The Nibbler', a total weight of 15,000 tons of large blocks of demolished concrete were reduced in size to one inch for use as aggregate fill material. Five thousand cubic yards of the crushed concrete was stockpiled for use as select backfill for construction of a five story parking garage. The material readily achieved specified compaction criteria. The remaining 2,500 cubic yards were used as sub base for rebuilding and resurfacing two blocks of Sixth Avenue. The salvaged 7,500 cubic yards of concrete was valued at \$60,000.

Metals were also salvaged from the buildings. Approximately 285 tons of steel and 15 tons of copper were sold, generating \$20,000 in revenue.

The most extraordinary material salvaged from the demolition was dozens of rare old growth timber Douglas fir beams. The prized 80 year old ceiling beams, measuring 2 x 3 feet and 40 to 60 feet long, were removed prior to demolishing the concrete walls. Careful planning minimized the length of time for traffic disruption on the city avenue next to the building. In total, 200,000 board feet (292 tons) of high grade select timbers with no knots or cracks were salvaged. The contractor did not release the price for the timbers, but based on e-bay pricing of \$5.50 per board foot for similar material, these rare, old growth timber Douglas fir beams were worth an estimated \$1.1 million.



Old growth timber beams were removed from the building to preserve their high value.

Demolition Contractor
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60 foot long old growth timber beams ready for shipping and minor re-milling.

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LEED™ Credit for Green Building

The 84 percent demolition recycling rate for this project exceeded the 50 percent required for Materials and Resource Credit 2.1 and the 75 percent required for Credit 2.2.

Accounting for Soil

The LEED™ system does not give credit for soil recycling. If it did, the recycling rate for this project would have been 90 percent rather than the stated 84 percent. Still, soil was handled in a very responsible manner, being reused on a nearby project.

The original building, a 'dock high warehouse,' was designed with a floor built on top of three feet of fill material throughout the building resulting in 8,000 cubic yards (12,000 tons) of soil that had to be salvaged. The soil was reused for compacting at a site in the Kent Valley. The cost of hauling the soil to Kent equaled the revenue so it was a break-even proposition. In doing so, the soil was kept out of the landfill, while generating some value as a compacting material.

Conclusion

Reef Anderson, Vice President of Iconco demolition and salvage contractors has been in the demolition business for 20 years and stated that recycling of demolition materials is, "the way it needs to be done", not just to meet or exceed LEED™ requirements, but to run a competitive business.

Mr. Anderson pointed out that early planning by the project manager drives successful demolition recycling. "Project managers need to allocate sufficient time for the demolition team to develop a materials investigation and separation plan. Unfortunately, project managers on tight timelines often perceive demolition as one of the few ways to speed a project to completion. Working in such great haste means there is no time to separate salvaged materials from the waste. It all ends up going to landfill, confirming the old adage 'haste makes waste'".



*A complete overhead site view
with adjacent I-5 and I-90
new on-ramp construction.*